



THERMAL ARC 300 GMS

USER'S MANUAL


The machine you have just acquired has taken advantages, in its production, of THERMADYNE INDUSTRIES 's wide experience in the manufacturing of welding machines, along with the latest technology strides in power electronics.

It will give you entire satisfaction for years if you respect all the operating and maintenance instructions given in this manual.

We strongly suggest to read very carefully chapters concerning security and individual protection before using this machine.

We thank you in advance for your co-operation.

THERMADYNE INDUSTRIES reserve the right to make changes without previous notification. Illustrations, descriptions and characteristics are not contractually binding and do not engage the responsibility of the manufacturer.

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In accordance with the warranty periods stated below, Thermadyne guarantees the proposed product to be free from defects in material or workmanship when operated in accordance with the written instructions as defined in this operating manual.

Thermadyne welding products are manufactured for use by commercial and industrial users and trained personnel with experience in the use and maintenance of electrical welding and cutting equipment.

Thermadyne will repair or replace, at its discretion, any warranted parts or components that fail due to defects in material or workmanship within the warranty period. The warranty period begins on the date of sale to the end user.

Thermal Arc 300 GMS	
Component	Warranty Period
Power Source	2 Years
Optional Remote Controls	6 Months

If warranty is being sought, Please contact your Thermadyne product supplier for the warranty repair procedure.

Thermadyne warranty will not apply to:

- Equipment that has been modified by any other party other than Thermadyne's own service personnel or with prior written consent obtained from Thermadyne Service Department.
- Equipment that has been used beyond the specifications established in the operating manual.
- Installation not in accordance with the installation/operating manual.
- Any product that has been subjected to abuse, misuse, negligence or accident.
- Failure to clean and maintain (including lack of lubrication, maintenance and protection), the machine as set forth in the operating, installation or service manual.

Within this operating manual are details regarding the maintenance necessary to ensure trouble free operation.

This manual also offers basic troubleshooting, operational and technical details including application usage.

You may also wish to visit our web site www.thermadyne.com select your product class and then select literature. Here you will find documentation including:

- Operator manuals
- Service manuals
- Product guides

Alternatively please contact your Thermadyne distributor and speak with a technical representative.

NOTE

Warranty repairs must be performed by either a Thermadyne Service Centre, a Thermadyne distributor or an Authorised Service Agent approved by the Company.

September 2009

The equipment you have just acquired will give you entire satisfaction if you respect the operating and maintenance instructions.

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Its design, the specification of the components and its manufacture are in accordance with the existing rules, French standards (NF), ISO and CEI international injunctions, EEC general lines and CEN/CENELEC standards.

In this chapter, you will find safety rules in the use of electric arc welding power sources with coated electrodes. We give you hereunder a list of recommendations and obligations you have to respect.

Safety rules must be observed, and particularly those relating to Decree 88.1056 dated November 14., 1988 concerning protective measures against electric currents.

1. ELECTROMAGNETIC COMPATIBILITY

1.1. DECLARATION OF CONFORMITY

THERMADYNE INDUSTRIES hereby declare that the machine object of this manual complies with the following European regulations :

Electromagnetic compatibility :

Rule 89/336-EEC of 3/05/89 modified by rules 92/31-EEC of 28/04/1992 and 93/68-EEC of 22/07/1993.

Low voltage :

Rule 73/23-EEC of 19/02/1973 modified by rule 93/68-EEC of 22/07/1993.

and with the national legislation transposing them.

THERMADYNE INDUSTRIES also declare that following harmonised standards have been applied :

EN 60974-10 (2003): Electromagnetic compatibility (CEM) – Product norm for arc welding material.

EN 50060 (1990): Current source for arc manual welding with limited service.

EN 60974-1: Security rules for electric welding material.
Part 1: welding current sources.

EN 50192 (1995): Arc welding material – plasma cutting systems.

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1.2. INSTALLATION AND USE

The machine object of this manual complies with the European regulations about electromagnetic compatibility 89/336 CEE. It also complies with EN 60974-10 standard: Electromagnetic compatibility, product standard for welding machines.

The user is responsible for installing and using the arc welding equipment according to the manufacturer's instructions.

If electromagnetic disturbances are detected, then it shall be the responsibility of the user of the arc welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit, see Note. In other cases it could involve constructing an electromagnetic screen enclosing the welding power source and the work complete with associated input filters. In all cases electromagnetic disturbances shall be reduced to the point, where they are no longer troublesome.

NOTE - The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths, which may damage the earth circuits of other equipment.

Further guidance is given in IEC 62081 "Arc welding equipment - Installation and use" (under consideration).

1.2.1. ASSESSMENT OF AREA

Before installing arc welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account :

- a) other supply cables, control cables, signalling and telephone cables, above, below and adjacent to the arc welding equipment;
- b) radio and television transmitters and receivers;
- c) computer and other control equipment;
- d) safety critical equipment, e.g. guarding of industrial equipment,
- e) the health of the people around, e.g. the use of pacemakers and hearing aids;
- f) equipment used for calibration or measurement;
- g) the immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;
- h) the time of day that welding or other activities are to be carried out.

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The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

1.2.2. METHODS OF REDUCING EMISSIONS

1.2.2.1. Public supply system

Arc welding equipment should be connected to the public supply system according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the public supply system. Consideration should be given to shielding the supply cable of permanently installed arc welding equipment, in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

1.2.2.2. Maintenance of the arc welding equipment

The arc welding equipment should be routinely maintained according to the manufacturers recommendations. All access and service doors and covers should be closed and properly fastened when the arc welding equipment is in operation. The arc welding equipment should not be modified in any way, except for those changes and adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

1.2.2.3. Welding cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

1.2.2.4. Equipotential bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered.

However, metallic components bonded to the work piece will increase the risk that the operator could receive an electric shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

1.2.2.5. Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, e.g. ships hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

1.2.2.6. Screening and shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.

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2. ELECTRIC SECURITY

2.1. CONNECTION OF THE WELDING POWER SOURCE TO THE NETWORK

Before connecting your equipment, you must check that:

-The meter, the safety device against over-currents, and the electric installation are compatible with the maximum power and the supply voltage of the welding power source (refer to the instructions plates).

-The connection, either single-phase, or three-phase with earth can be effected on a socket compatible with the welding power source cable plug.

If the cable is connected to a fixed post, the earth, if provided, will never be cut by the safety device against electric shocks.

-The ON/OFF switch (if exists) situated on the welding power source, is turned off.

2.2. WORKING AREA

The use of arc welding implies a strict respect of safety conditions with regard to electric currents (Decree dated 14.12.1988).

It is necessary to check that no metal piece accessible to the operators and to their assistants can come into direct contact with a phase conductor and the neutral of the network. In case of uncertainty, this metal part will be connected to the earth with a conductor of at least equivalent section to the largest phase conductor.

Make sure that all metal pieces that the operator could touch with a non insulated part of his body (head, hands without gloves on, naked arms ...) is properly grounded with a conductor of at least equivalent section to the biggest supply cable of the ground clamp or welding torch. If more than one metal ground are concerned, they need to be all interlinked in one, which must be grounded in the same conditions.

Unless very special care have been taken, do not proceed to any arc welding or cutting in

conductive enclosures, whether it is a confined space or the welding machine has to be left outside. Be even more prudent when welding in humid or not ventilated areas, and if the power source is placed inside (Decree dated 14.12.1988, Art. 4).

2.3. INTERVENING

-Before carrying out any internal checking or repair work, check that the power source has been separated from the electrical installation by locking and guard devices.

-The current plug has to be taken out. Provisions have to be taken to prevent an accidental connection of the plug to a socket.

-Cut-off through a fixed connecting device has to be omnipolar (phases and neutral). It is in the "OFF" position and cannot be accidentally put into operation.

-Maintenance works of electrical equipment must be entrusted to qualified people (Section VI, Art. 46).

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2.4. MAINTENANCE

Check the good state, insulation and connection of all the equipment and electrical accessories: plugs and flexible supply cables, cables (NF A 32-510), conduits, connectors, extension cables (NF A 85-610 and CENELEC HD 433), sockets on the power source, ground and electrode-holder clamps (NF A 85-600).

These connections and mobile accessories are marked according to standards, if consistent with the safety rules. They can either be controlled by you or by accredited firms.

- Maintenance and repair works of conduits and liners have to be properly carried out (Section VI, Art. 47).
- Repair or replace all defective accessories
- Check periodically that the electrical connections are tightened and do not heat.

2.5. RISKS OF FIRE AND EXPLOSION

Welding can occur risks of fire or explosion. You have to pay attention to fire safety regulation

- Remove flammable or explosive materials from welding area.
- Always have sufficient fire fighting equipment
- Fire can break out from sparks even several hours after the welding work has been finished.

3. INDIVIDUAL PROTECTION

3.1. RISK OF EXTERNAL INJURIES

3.1.1. THE WHOLE BODY

Arc rays produce very bright ultra violet and infra red light. They will damage yours eyes and burn your skin if you are not properly protected

- The welder is dressed and protected according to the constraints his works impose him.
- Insulate yourself from the workpiece and the ground. Make sure that no metal piece, especially those connected to the network, can come into contact with the operator.
- The welder must always wear an individual insulating protection (decree of 14/12/1988, article 3-3).

Protective clothing : gloves, aprons, safety shoes offer the additional advantage to protect the operator against burns caused by hot pieces, spatters ...

Check the good state of these equipment and replace them before you are not protected any more.

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3.1.2. FACE AND EYES

- It is absolutely necessary to protect your eyes against arc rays.
- Protect your hair and your face against sparks

The welding shield, with or without headset, is always equipped with a proper filter according to the arc welding current (NS S 77-104 / A 88-221 / A 88.222 standards).

In order to protect shaded filter from impacts and sparks, you have to add a plain glass in front of the shield.

The helmet provided with your equipment (if requested) is equipped with a protective filter. When you want to replace it, precise the reference and number of opacity degree of the filter. Use the shade of lens as recommended in the instruction manual (opacity graduation number)

Protect others in the work area from arc rays by using protective booths, UV protective goggles, and if necessary, a welding shield with appropriate protective filter on (NF S 77-104 - by A 1.5).

Opacity graduation numbers and recommended use for arc welding

Welding process or connected techniques	Current intensity in Amps															
	0.5	2.5	10	20	40	80	125	175	225	275	350	450				
	1	5	15	30	60	100	150	200	250	300	400	500				
Coated electrodes					9	10	11	12		13	14					
MIG on heavy metals						10	11	12		13	14					
MIG on light alloys						10	11	12	13	14	15					
TIG on all metals				9	10	11	12	13	14							
MAG						10	11	12	13	14	15					
Air/Arc gouging								10	11	12	13	14	15			
Plasma cutting				9	10	11	12	13								
Depending on the conditions of use, the next highest or lowest category number may be used.																
The expression “heavy metals” covers steels, alloyed steels, copper and its alloys.																
The shaded areas represent applications where the welding processes are not normally used at present.																

CARE : Use a higher degree of filters if welding is performed in premises which are not well lighted.

3.2. RISK OF INTERNAL INJURIES

GASES AND FUMES

Gases fumes produced during the welding process can be dangerous and hazardous to your health. Arc welding works have to be carried out in suitable ventilated areas.

Ventilation must be adequate to remove gases and fumes during operation. All fumes produced during welding have to be removed as soon as they are given off, and as close as possible from the place they are produced to be the most efficient.

Vapors of chlorinated solvents can form the toxic gas phosgene when exposed to ultraviolet radiation from an electric arc.

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3.3. SAFETY IN THE USE OF GASES (WELDING WITH TIG OR MIG INERT GASES)

3.3.1. COMPRESSED GAS CYLINDERS

Compressed gas cylinders are potentially dangerous. Refer to suppliers for proper handling procedures.

- No impact: secure the cylinders and keep them away from impacts.
- No excess heat (over 50°C)

3.3.2. PRESSURE RELIEF VALVE

Check that the pressure relief screw is slackened off before connecting to the cylinder.

Check that the union is tight before opening the valve of the cylinder. Open it slowly a fraction of a turn.

If there is a leak, NEVER tighten a union which is under pressure, but first close the valve on the cylinder.

Always check that hoses are in good condition.

3.3.3. DETAILS ABOUT GASES

Gas and gaseous mixtures containing less than 20% of CO₂:

If these gases or mixtures take the place of the oxygen in the air, there is a danger of asphyxia. An atmosphere containing less than 17% oxygen is dangerous.

hydrogen and hydrogen-based combustible gaseous mixtures

These are very light gases. In the case of leaks, they collect under the ceiling.

Provide for ventilation at ceiling level.


These are also inflammable gases. The flame of hydrogen is almost invisible. There is therefore a risk of burns.

Air/hydrogen and oxygen/hydrogen mixtures are explosive in the following proportions:

- 4 to 74.5 % of hydrogen in air.
- 4 to 94 % of hydrogen in oxygen.

Store the bottles in the open or in a well-ventilated place.

Avoid any leakage by limiting the number of connections or couplings to a minimum.

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4. GENERAL CHARACTERISTICS

The three phase power source THERMAL ARC 300 GMS has been designed as integrated and portable units using the latest techniques in power electronics, based on an IGBT controlled **inverter process**, which enables the following:

- a considerable reduction of weight and volume
- the dynamic control of the welding current
- a high power in a small space at a very low power consumption

With their innovative design, these machines are both **robust** (plastic front and back panel, new internal conception) and **ergonomic**.

The THERMAL ARC 300 GMS units are multiprocess DC inverters which allow:

- **MMA welding (stick welding)** : with coated electrodes up to 5 mm
- **TIG welding** : with infusible electrodes . Ignition made with lift arc process.
2 stroke or 4 stroke mode
Post gas adjustment
Down-slope time adjustment
Gas purge
- **MIG welding** : wire feeder built in
15 kgs spools
steel wire, stainless steel wire of diameter 0.6 mm to 1.2 mm
direct or reverse polarity of the wire
2 stroke or 4 stroke mode
Post gas adjustment
Cold wire inch
Burn-back adjustment
Inductor linear adjustment

Spot MIG welding :
with adjustment of the spot's time

Intermittent MIG welding :
with adjustment of the spot's time and of their frequency.

Program :
Possibility to save and load welding parameters


This power source offers exceptional arc stability.

Easy to use, it can be adjusted exactly to your need :

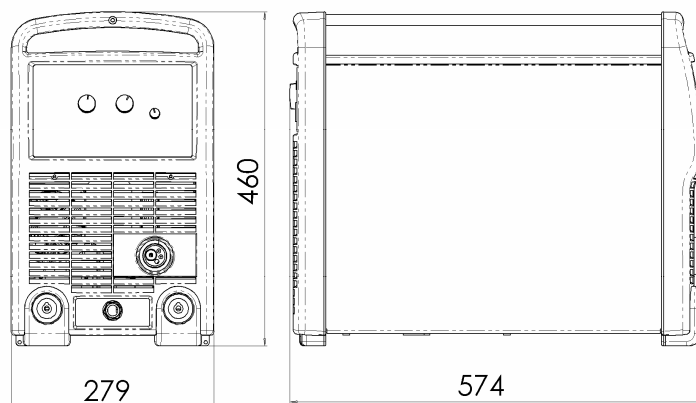
- It has a linear electronic inductor, which allows the arc adjustment (soft or hard) and limits the amount of spatter.
- It has an adjustable burn-back which allows to adjust the wire's length on the torch's head at the end of the welding.

(All parameters adjustment p.18 to 24)

It's perfectly suited to the MIG welding with aluminium wire.


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5. TECHNICAL CHARACTERISTICS



DIMENSIONS (in mm)

PRIMARY				
three phased power supply	V	400 +/-10%		
Frequency	Hz	50 / 60		
		MMA	TIG	MIG
Maximum primary current	A	13	10.8	13.2
Maximum power consumption	kVA	9.1	7.4	9.3
Power factor (cos Ø)		0.98		
Primary protection	A	16		
SECONDARY				
		MMA	TIG	MIG
Off load voltage	V	50-60	50-60	50-60
Welding current range	A	3 - 250	3 - 300	3-280
Welding current at 40°C				
Welding current at 40 %	A	250	300	280
Welding current at 60 %	A	230	250	250
Welding current at 100 %	A	190	210	210
Protection degree		IP 23		
Insulation class		H		
Standards		EN 60974-1 / EN 60974-10		
Weight	kg	25		
Dimensions L x W x H	mm	570 x 279 x 460		

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6. CONNECTION TO THE MAIN SUPPLY

The power source must be connected to a three-phase 400V - 50 Hz/60 Hz mains + ground

It has built-in over voltage protection which allows engine driven generator supply

Main supply must be protected by fuses or circuit-breaker according to the value $I_{1\text{eff}}$ written on the specifications of the power source.

it is strongly suggested to use a differential protection for the operator's safety.

7. CONNECTION TO THE GROUND

For the operator's protection, the power source must be correctly grounded (according to the International Protections Norms).

It is absolutely necessary to set a good ground connection installation with the green/yellow leading of the power cable. This will avoid discharges caused by accidental contacts with grounded pieces.


If no earth connection has been set, a high risk of electric shock through the chassis of the unit remains possible.

8. PRELIMINARY PRECAUTIONS

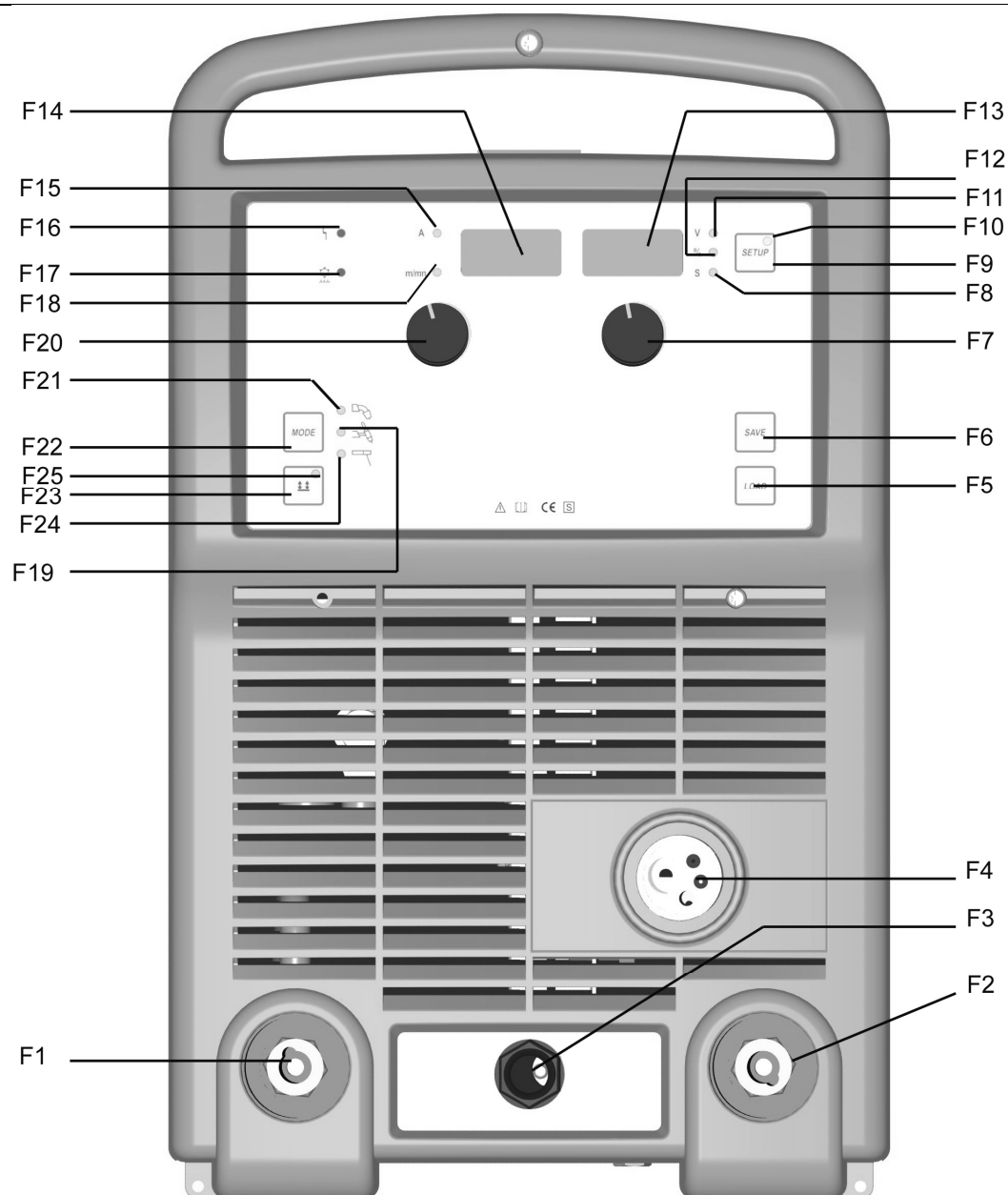
For the good operation of your welding power source, make sure that the air flow produced by the fan inside the unit is not obstructed.


Also try to operate in a non-dusty area.

Avoid all impacts, exposure to damp areas or excessive temperatures.

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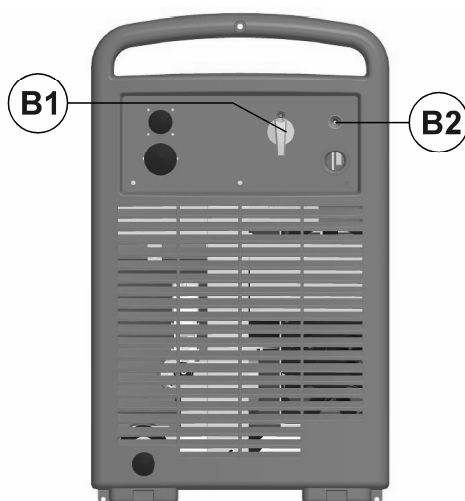
9. DESCRIPTION OF THE FRONT PANEL




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ITEM	DESCRIPTION
F1	Power terminal +
F2	Power terminal -
F3	Torch's polarity connection
F4	Torch's EURO connector
F5	Setting key for "LOAD" program
F6	Setting key for "SAVE" program
F7	F13 adjustment knob
F8	«second» indicator on F13 display
F9	Setting key for "SET UP" program
F10	"SET UP" program indicator
F11	«Volt» indicator on F13 display
F12	«%» indicator on F13 display
F13	Digital display
F14	Digital display
F15	«Amps» indicator on F14 display
F16	Power supply fault indicator
F17	« Water colling fault » indicator
F18	«m/min» indicator on F14 display
F19	« TIG welding » indicator
F20	F14 adjustment knob
F21	« MIG welding » indicator
F22	Setting key for selecting welding mode
F23	Setting key for selecting 2 strokes or 4 strokes welding mode
F24	« MMA welding » indicator
F25	Indicator « 4 strokes welding »

10. DESCRIPTION OF THE BACK PANEL



ITEM	DESCRIPTION
B1	Switch ON/OFF
B2	Gas input

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NOTE : *FP = Factory parameter

11. MMA (STICK) WELDING

Connect the power source to the main supply and the ground as explained in the chapter « Setting up » (as 6 and 7 section).

Connect the ground cable and the electrode-holder to the appropriate power connections + **F1** and – **F2** according to the electrode polarity being used (refer to the electrodes manufacturer's datasheets).

The "torch's polarity connection" **F3** is not connected.

Start up the power source with the main switch ON/OFF **B1**.

Select MMA(stick) welding mode with the setting key **F22**, the indicator **F24** illuminates.

Adjust welding current with knob **F20**.

Place the electrode on the piece you have to weld in order to strike the arc.

Arc force control

FP*: OFF

Select "**SET UP**" menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select "**DYN**" function on **F14** display.

With knob **F7**, adjust the arc force between **1** and **99%** on display **F13**.

To exit this function, select "**SET UP**". The indicator **F10** is off.

HOT START control

FP*: OFF

Select "**SET UP**" menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select "**HOT**" function on **F14** display.

With knob **F7**, adjust the HOT START between **0.1** and **3** sec. on display **F13**.

To exit this function, select "**SET UP**". The indicator **F10** is off.

Off load voltage control

FP*: OFF

Select "**SET UP**" menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select "**URD**" function on **F14** display.

With knob **F7**, choose the output load voltage on display **F13** between:

- "OFF" (standard off load voltage)
- "ON" 20 V (limited to 20V)

To exit this function, select "**SET UP**". The indicator **F10** is off.

12. TIG WELDING

Connect the unit

Connect the power source to the main supply and the ground as explained in the chapter « Setting up » (as 6 and 7 section).

Connect the ground cable to the power terminal + **F1** and the torch's polarity connection **F3** to the – **F2**.

Connect the torch in the EURO connector **F4** and do it up to the end of the threads.


Connect the gas supply

Open the valve of the bottle for a moment to remove any impurities.

Fit the flow-control valve (flow from 5 to 8 l/mn) to the output of the bottle and its pipe.

Connect the gas pipe at the rear of the machine, to the gas input **B2**.

Open the bottle.

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Set TIG parameters

Start up the power source with the main switch ON/OFF **B1**.

- TIG welding mode choice

Select TIG welding mode with the setting key **F22**, the indicator **F19** illuminates.

- 2 strokes or 4 strokes mode

If the indicator **F25** is OFF, 2 stroke mode is selected.

Select 4 stroke mode with the setting key **F23**, the indicator **F25** illuminates.

- Post gas

FP* : Auto

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**tPo**” function on **F14** display.

With knob **F7**, control and adjust the post gas between **3** and **25** sec. on display **F13** or select “**AUTO**” function (post gas is automatically regulated).

To exit this function, select “**SET UP**” **F9** The indicator **F10** is off

- Down-slope time

Adjust the down-slope time from 0 to 16s with the knob **F7**.

- Welding current

Adjust the welding current with the knob **F20**.

- Pre gas

FP : 0.5 sec

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**tPR**” function on **F14** display.

With knob **F7**, adjust the pre gas between **0.1** to **5.0** sec on display **F13**.

To exit this function, select “**SET UP**” **F9** The indicator **F10** is off

Initial current control

FP*: 50%

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**IS**” function on **F14** display.

With knob **F7**, control and adjust the initial current (percentage of welding current) between 30% and 200%.

To exit this function, select “**SET UP**” **F9**. The indicator **F10** is off

Time of progressive start current

FP*: 1 sec

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**tUP**” function on **F14** display.

With knob **F7**, adjust the time between **0.1** and **10** sec or select “**OFF**”.


To exit this function, select “**SET UP**” **F9** The indicator **F10** is off

Time of up-current (up slope)

FP* : 0.1

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**TIG**” function on **F14** display.

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With knob **F7**, adjust the post gas between **0.01** and **0.2** sec. on display **F13** or select "**OFF**" function.
To exit this function, select "**SET UP**". **F9** The indicator **F10** is off

Final current control

FP*: 30%

Select "**SET UP**" menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select "**IF**" function on **F14** display.

With knob **F7**, adjust the parameter between **30%** and **100%** of welding current.

To exit this function, select "**SET UP**". The indicator **F10** is off

Spot welding control

FP*: OFF

Select "**SET UP**" menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select "**Spt**" function on **F14** display.

With knob **F7**, adjust the time spot between **0.1** and **25** second. To stop Spot welding, select "**OFF**".

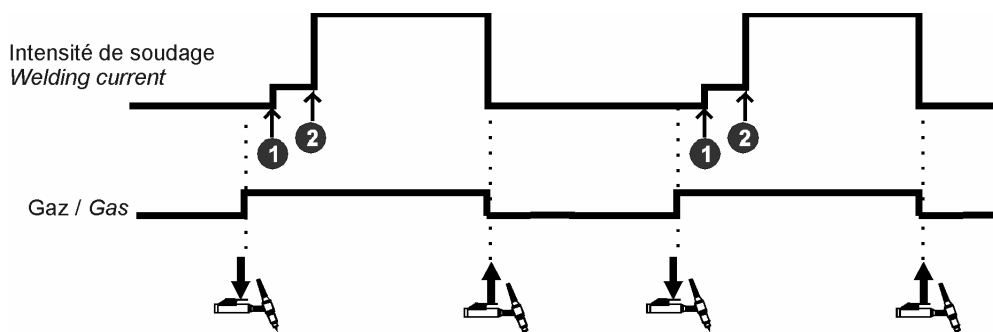
To exit this function, select "**SET UP**". The indicator **F10** is off

Welding

Put the tungsten electrode in direct contact with the workpiece. Push on the trigger.

Raise the torch slowly. The arc strike start according to the cycle described hereunder.

NOTE : When the tungsten electrode comes into contact with the workpiece, the current is maintained at a low value till the electrode lifts up in order to avoid tungstens penetration




① électrode tungstène en contact avec la pièce / tungsten electrode in contact with the piece

② remontée de l'électrode tungstène / tungsten electrode lifts up

Purge the gas and wire test

Press the purge gas knob or test gas knob inside the wire feeder

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13. MIG WELDING

13.1. PREPARATION

Connect the unit

Connect the power source to the main supply and the ground as explained in the chapter « Setting up » (as para 6 and 7).

Connect the ground cable and the torch's polarity connection **F3** to the power connection + **F1** and – **F2**, regarding to the type of wire used.

Connect the gas supply

Open the valve of the bottle for a moment to remove any impurities.

Fit the flow-control valve (flow from 5 to 8 l/mn) to the output of the bottle and its pipe.

Connect the gas pipe at the rear of the machine, to the gas input **B2**.

Open the bottle.

Fitting the feed rolls

Place the fitted feed rolls in the wire feeding unit according to the instructions given in chapter 17.

It is essential that the spool be fitted with the appropriate feed rolls, to provide the best welding and spooling conditions.

Install the wire in the spool

(please see the spare parts lists of the machine in chapter 17)

You can use wire's type : steel, stainless steel, aluminium wire from 0.6 mm to 1.0 mm.

Undo the retaining screw of the spool (screw on **Item. 22**) .

Engage the spool on its support, (**Item. 22**), taking care to position the rod of the spool brake correctly. The spool must be mounted so that the wire is spooled from below.

The firmness of the spool brake can be adjusted using the central screw located behind the screw (**Item. 22**).

This system allows the motion of the spool to be stopped at the end of spooling, preventing it from rotating further. This is vital when one is spooling at high speeds. **Nevertheless, the spool should not be braked excessively, in order not to overload the motor.**

Re-fit the retaining screw (screw on **Item. 22**).

Engage the wire in the wire feeding unit according to the instruction given chapter 17 and let it go out the EURO connector **F4**.

13.2. ADJUSTMENT OF THE PARAMETERS


MIG welding mode

Select MIG welding mode with the setting key **F22**, the indicator **F21** illuminates.

2 strokes or 4 strokes mode

If the indicator **F25** is OFF, 2 stroke mode is selected.

Select 4 strokes mode with the setting key **F23**, the indicator **F25** illuminates.

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Pre gas

FP*: 0.5 sec

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**tPr**” function on **F14** display.

With knob **F7**, adjust the pre-gas between **0.1 à 5 sec.** or “**OFF**” on display **F13**.

To exit this function, select “**SET UP**”. The indicator **F10** is off

Inductance control (spatter limitation)

FP*: 60%

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**Ind**” function on **F14** display.

With knob **F7**, control and adjust the inductance between **0 and 100%**

To exit this function, select “**SET UP**” **F9**. The indicator **F10** is off

BURN BACK control

FP : 0.4 sec

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**bb**” function on **F14** display.

With knob **F7**, control and adjust the BURN BACK between **0.1 and 1.0 second**.

To exit this function, select “**SET UP**”. The indicator **F10** is off

Post gas

FP* : 3 sec

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select “**tPo**” function on **F14** display.

With knob **F7**, control and adjust the post between **0.1 and 10 sec**.

To exit this function, select **F9** “**SET UP**”. The indicator **F10** is off (post gas is automatically regulated).

HOT START control

FP* : 35%

Select “**SET UP**” menu with the setting key **F9**, the indicator **F10** illuminates.

With the knob **F20**, select “**Hot**” function on **F14** display.

With knob **F7**, control and adjust the HOT START between **0 to 100%** on display **F13**.


To exit this function, select **F9** “**SET UP**”. The indicator **F10** is off.

Wire speed

Adjust the wire speed from 1 to 15 m/min with knob **F20** on **F14** display

Arc voltage

Adjust the arc voltage from 14V to 28V with the knob **F7** on **F13** display

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14. SPOT MIG WELDING

Read the instructions for the preparation of the generator given in **13.1** section

Select **"SET UP"** menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select **"Spt"** function on **F14** display.

With knob **F7**, adjust the time spot between **0.1** and **2.5** second. To stop Spot welding, select **"OFF"**.

To exit this function, select **"SET UP"** **F9**. The indicator **F10** is off

Welding

Depress the torch's trigger in order to start welding. The arc stops after the spot time.

Release and depress the trigger to start a new spot time.

15. INTERMITTENT MIG WELDING

Read the instructions for the preparation of the generator given in **13.1**

Spot time

Select **"SET UP"** menu with the setting key **F9**, the indicator **F10** flashes.

With the knob **F20**, select **"Spt"** function on **F14** display.

With knob **F7**, adjust the time spot between **0.1** and **2.5** sec on **F13** display. To stop Spot welding, select **"OFF"**.

To exit this function, select **F13 "SET UP"**. The indicator **F10** is off

Time adjustment between spots

Select **"SET UP"** menu with the setting key **F9**, the indicator **F10** flashes.


With the knob **F20**, select **"Int"** function on **F14** display.

With knob **F7**, adjust the time spot between **0.4** and **25** sec on **F13** display. To stop intermittent welding, select **"OFF"**.

To exit this function, select **"SET UP"**. The indicator **F10** is off

Welding

Depress the torch's trigger in order to start welding. When holding on the trigger, you will do the welding cycles defined with parameters adjusted above. Release the trigger to stop the cycle.

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16. « SAVE » AND « LOAD » MENU

« SAVE » to save welding parameters (1 to 15 programs)

- 1) Press **"SAVE"** key for SAVE menu – **"SAU"** is flashing = SAVE
- 2) Choice a program number from 1 to 15 with the knob **F7** in the right display **F13**
- 3) Press **SAVE** key during 3 seconds to memorise the parameters program. The right display shows « **yES** » =**YES** flashing
- 4) Press **SAVE** key to exit the **SAVE** mode


« LOAD » loading registered parameters

- 5) Press **"LOAD"** key for SAVE menu – **"Ld"** is flashing = SAVE
- 6) Choice a program number from 1 to 15 with the knob **F7** in the right display **F13**
- 7) Press **LOAD** key during 3 seconds to load registered programs. The right display shows « **yES** » =**YES** flashing
- 8) Press **LOAD** key to exit the **SAVE** mode

After loading saved program, it's possible to adjust all parameters but they won't be automatically saved

« LOAD » Loading factory parameters

- 9) Press **"LOAD"** key for SAVE menu – **"Ld"** is flashing = SAVE
- 10) Select **"FAC"** with the knob **F7** in the right display **F13**
- 11) Press **LOAD** key during 3 seconds to load factory preset. The right display shows « **FAC** » =**YES** flashing
- 12) Press **SAVE** key to exit the **SAVE** mode

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17. MAINTENANCE

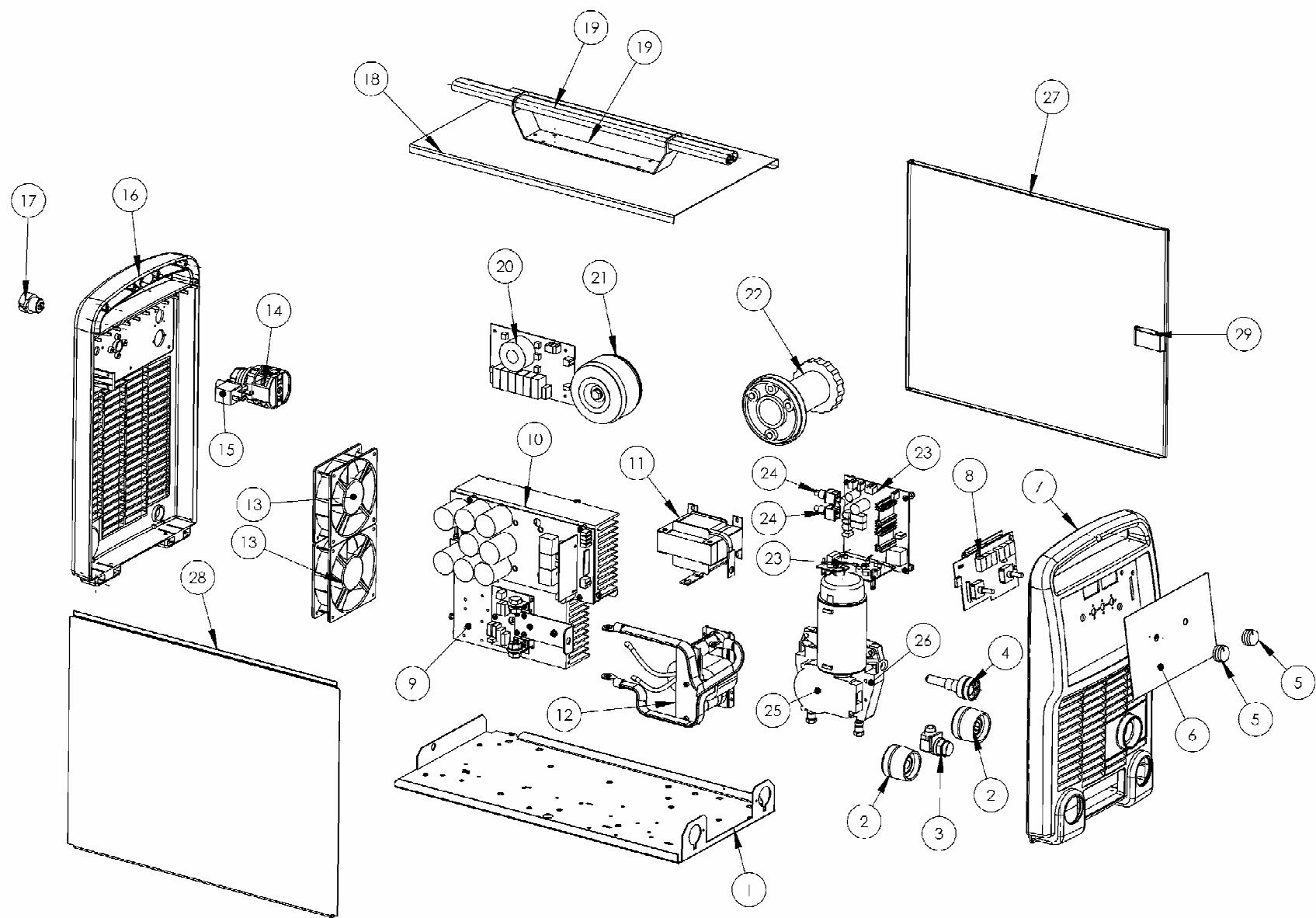
CAUTION : BEFORE OPENING the unit, disconnect the power source from the mains. Voltages are high and dangerous inside the machine.

In spite of their robustness, THERMADYNE INDUSTRIES' power sources require some regular maintenance. Once every 6 months (more often in dusty surroundings) :

- the machine must be blown through with dry, oilfree compressed air
- check for continuity all electrical connections.
- Check the connection of cables and flat top.


18. SPARE PARTS

SPARE PARTS OF THE POWER SOURCE

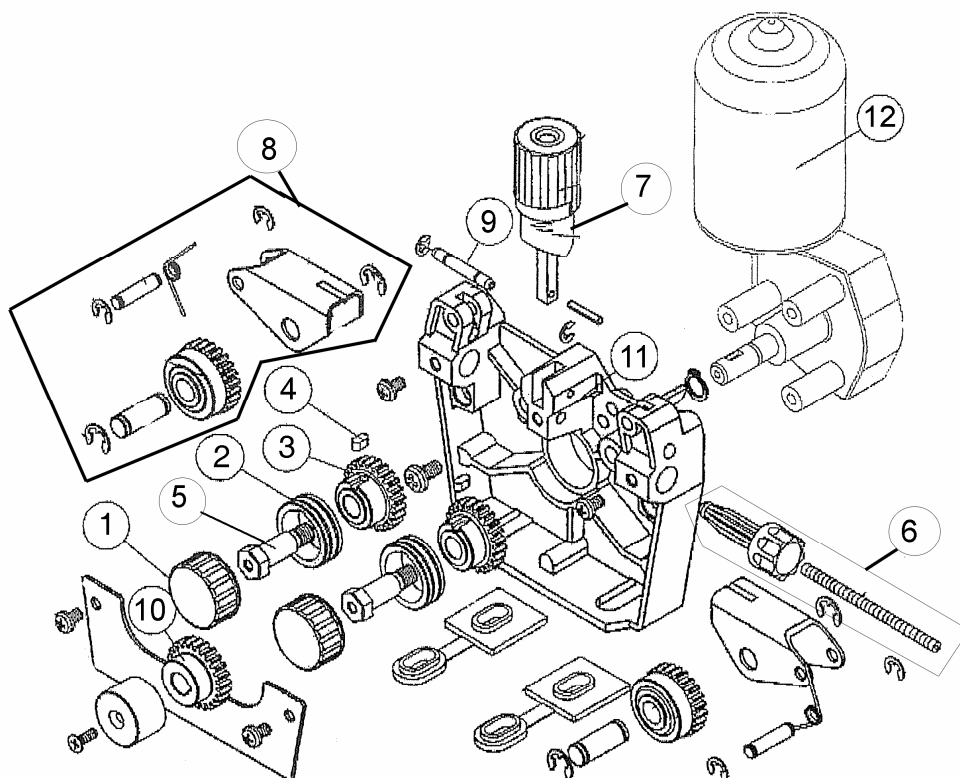


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ITEM	REFERENCE	DESCRIPTION
1	I06002	Chassis
2	060153	Power terminal 35/50 mm ²
3	B06050	Cable anchorage
4	C60438	EURO connector
5	B01062	Knob diam. 23
6	B00022/TH	Front fascia
7	I06013	Black front frame
8	E32420	Display and control PCB
9	E92280	Secondary PCB
10	E32418	Primary PCB
11	T18119	Inductor
12	T18120	Power transformer
13	V01008	Fan
14	G02011	ON/OFF commutator
15	F04002	Gas valve 230 Vac
	F18008	Adaptor F12/100 –M 3/8 BSP
16	I06021/MIG	Black back frame
17	C02107	Female socket 7 pins
18	I06034/P3005	Painted cover
19	I06099/P3005	Painted handle's support
	J15021-4/P9005	Painted handle
20	L93821	EMI PCB
21	T18122	Supply transformer
22	U20030	Spool support with screw
23	E32419	Wire feeder PCB
24	B05001	Black push button
25	U21033	Complete wire feeder unit
26	U45801	Wire feeding unit without motor
	U21033-1	Motor without wire feeding unit
27	I06036/P3005	Painted door
28	I06035/P3005	Painted left panel
29	A20002	Lock for door

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COMPLETE WIRE FEEDING UNIT U21033



REP	REF	DESCRIPTION
1	U46001	Fixing cap
2	U45807	Feed roll diam 0.8 / 1.0 - « V » groove
	U45810	Feed roll diam 1.0 / 1.2 - « V » groove
	U45823	Feed roll diam 0.8 / 1.0 - « U » groove
	U45820	Feed roll diam 1.0 / 1.2 - « U » groove
3	U46002	Gear Wheel
4	U45435	Parallel key 4x4x8
5	U46009	shaft
6	U46003	Complete wire inlet guide
7	U45850	Fixing shaft
8	U46005	Complete pressure arm
9	U46006-D2	Intermediate wire guide
10	U46007	Gear wheel
11	U46008	Aluminium support
12	U21033-1	Motor 42V without wire feeding unit
	U45801	Wire feeding unit without motor

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The wire feeding unit consists of one pressure feed roll at the top, usable for all the wires, and one grooved feed roll (**Rep. 2**) at the lower, which have to be adapted to the nature of the wire and to its diameter.

It is essential that the spool be fitted with the appropriate feed rolls, so as to provide the best welding and spooling conditions.

Each grooved feed roll is designed to weld 2 different diameters. To change diameter, the feed roll is just turned round. The feed rolls mounted as standard on delivery are designed to weld steel/stainless steel wire (triangular groove in « V ») 0.6 or 0.8 mm in diameter (by turning the feed roll). Another feed roll is supplied for steel wire of 0.8 or 1.0 mm in diameter.

Spooling of aluminium wires :

For aluminium wire, semicircular grooved (in « U ») feed rolls are available as options in diameters 0.6/0.8 mm and 0.8/1.0 mm.

These type of feed rolls are recommended for spooling of aluminium wires, since they prevent deformation or crushing of the wire.

Replacing the feed rolls

Release the pressure of the upper feed roll, using knob of the fixing shaft (**Rep. 7**).

Undo the fixing cap (**Rep. 1**) of the lower feed roll.

Remove the lower feed roll (**Rep. 2**), and turn it or fit a different feed roll in its place.

Engage the feed roll well down onto the gear wheel (**Rep. 3**).

Refit the fixing cap (**Rep. 1**).

Refit the pressure of the upper feed roll, using knob of the fixing shaft (**Rep. 7**).

Place the wire in the wire feeding unit

Release the pressure of the upper feed roll, using knob of the fixing shaft (**Rep. 7**).

Engage the wire in the inlet guide (**Rep. 6**), then in the groove of the feed roll, finally in the wire inlet of the EURO connector **F14** until the wire comes out of the connector

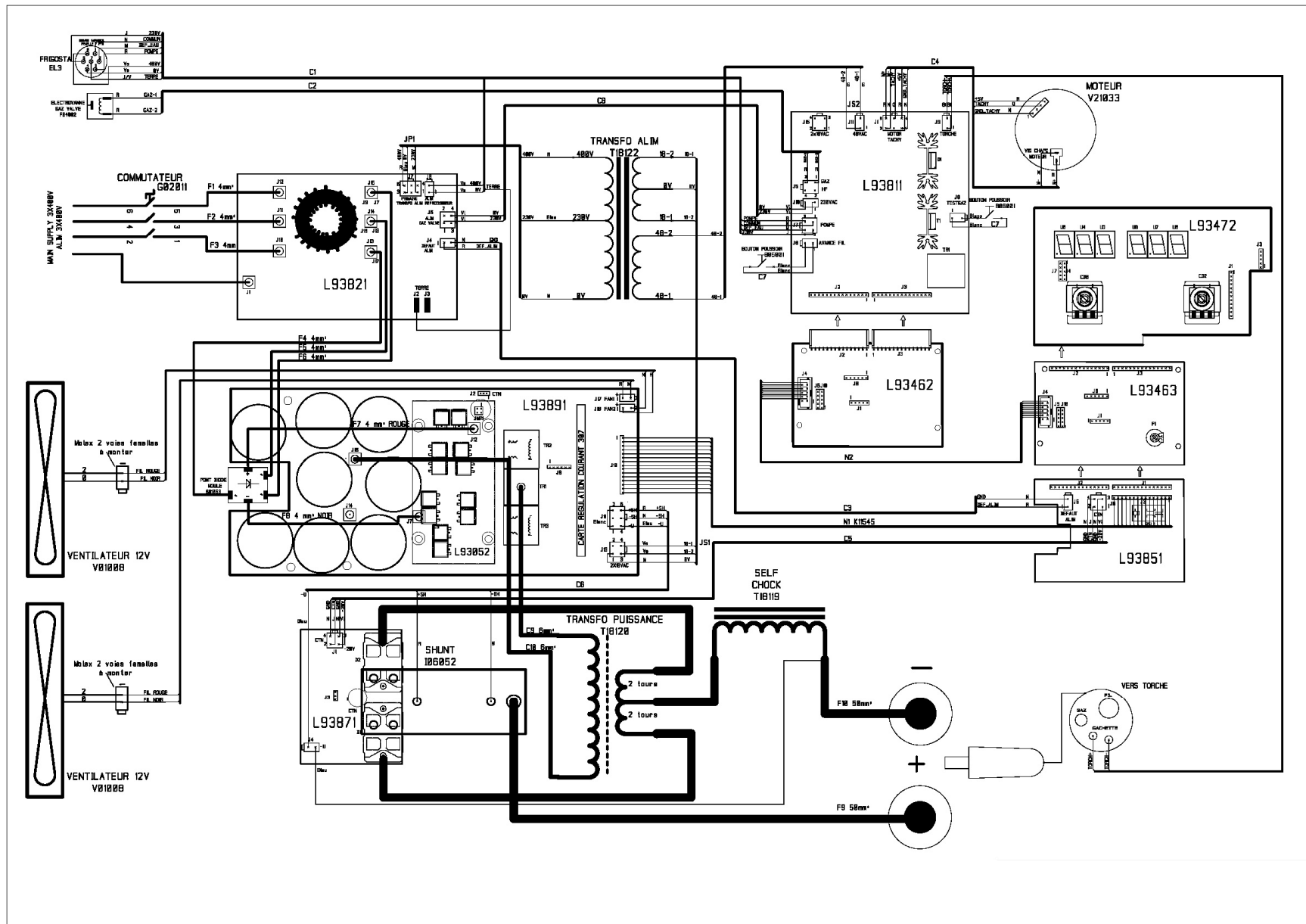
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19. TROUBLE SHOOTING

CAUTION : BEFORE ANY INTERNAL CHECKS ARE MADE, disconnect the power source from the power supply. Internals voltages are high and dangerous

POSSIBLE CAUSES	CHECKING / REMEDY
FRONT PANEL OFF = NO SUPPLY	
ON/OFF main switch is OFF	Put the switch ON
Power supply cable is cut	Check cable and connections
No main supply	Check circuit breaker and fuses
Defective ON/OFF main switch	Replace the switch
DIGITAL DISPLAY OFF AND INDICATOR F16 ON = INPUT VOLTAGE DEFAULT	
Input voltage too low	Check supply voltage
Lack of one phase	Check the supply
DIGITAL DISPLAY F13 FLASHES AND SHOWS « tPb » = PRIMARY WARMING UP	
Primary temperature over rated	The machine doesn't stop but the welding current is limited to 0A
DIGITAL DISPLAY F13 FLICKERS AND SHOWS « tSb » AND INDICATOR F13 ON = SECONDARY WARMING UP	
Secondary temperature over rated	The machine doesn't stop but the welding current is limited to 0A
DIGITAL DISPLAY F13 FLASHES AND SHOWS « tH » = WARMING UP	
Duty cycle over rated (particularity if ambient t° is > 40°C)	Let the machine cool, it will automatically start again
Insufficient cooling air	Clean the air inlets
Very dusty machine	Open the machine and blow it through
Fan doesn't start	Replace the fan
DIGITAL DISPLAY F13 FLASHES AND SHOWS « coL » AND INDICATOR F17 ON = COOLING UNIT FAULT	
The machine stops until repair of the default	
Lack of water	Check the water level
Water circuit blocked up	Check the torch
STICK WELDING - IMPROPER WELDING	
Wrong electrode polarity	Use the right polarity according to the indications of electrode's manufacturer
TIG - IGNITION FAILURE	
Wrong polarity	Check the connection Torch to power terminal – Ground to power terminal +
Pre gas time selected	You must wait for the end of the pre gas flow or cancel it
DIGITAL DISPLAY F13 FLASHES AND SHOWS « C O » = OVER LOAD	
Over load indication	Press the MIG GUN switch
DIGITAL DISPLAY F13 FLICKERS AND SHOWS « FED » = WIRE FEEDER DEFAULT	
Wire feeding fault	Check the wire feeder motor
OTHER FAILURES	
No gas arrives to the machine	Check the gas supply
No gas goes out of the machine	Check the gas valve
Initial current too low	Check the value of initial current (see chapter 12)

20. WIRING DIAGRAM



21. APPENDICE

	Unit	THERMAL ARC 300 GMS
Stick welding		
Welding current range	A	3 - 250
Arc force control	%	OFF – 1 to 99%
Hot Start	S	OFF - 0.1 to 3
Off low voltage	V	20 or 50/60
TIG Welding		
Welding current range	A	3 - 300
Post gas	s	AUTO - 3 to 25
Down slope	s	0 - 16
Pre gas	s	0.1 – 5.0
Start current	%	30% - 200%
Progressive time of start current	s	0.01 – 10
Time of over-current start	s	0.01 – 0.20
Final current	%	30 - 100
MIG Welding		
Arc voltage	V	14 - 28
Wire speed	m/min	1 - 15
Post gas	s	1 - 10
Inductor	%	0 - 100
Burn back	s	0.1- 1
Spot's length	s	0.1 - 2.5
Time between 2 spots	s	0.4 - 2.5

NOTES

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